

SmartAmerica

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The Vision of SmartAmerica

Demonstrate the benefits of interconnected Cyber-Physical Systems including improved safety, sustainability, efficiency, healthcare, and travel on the backdrop of a virtual Smart City

The Issue

Despite significant progress for years in Cyber-Physical Systems research and development, there is still a gap between R&D and ***nation-wide, across-the-board*** adoption of Cyber-Physical Systems in our daily life.

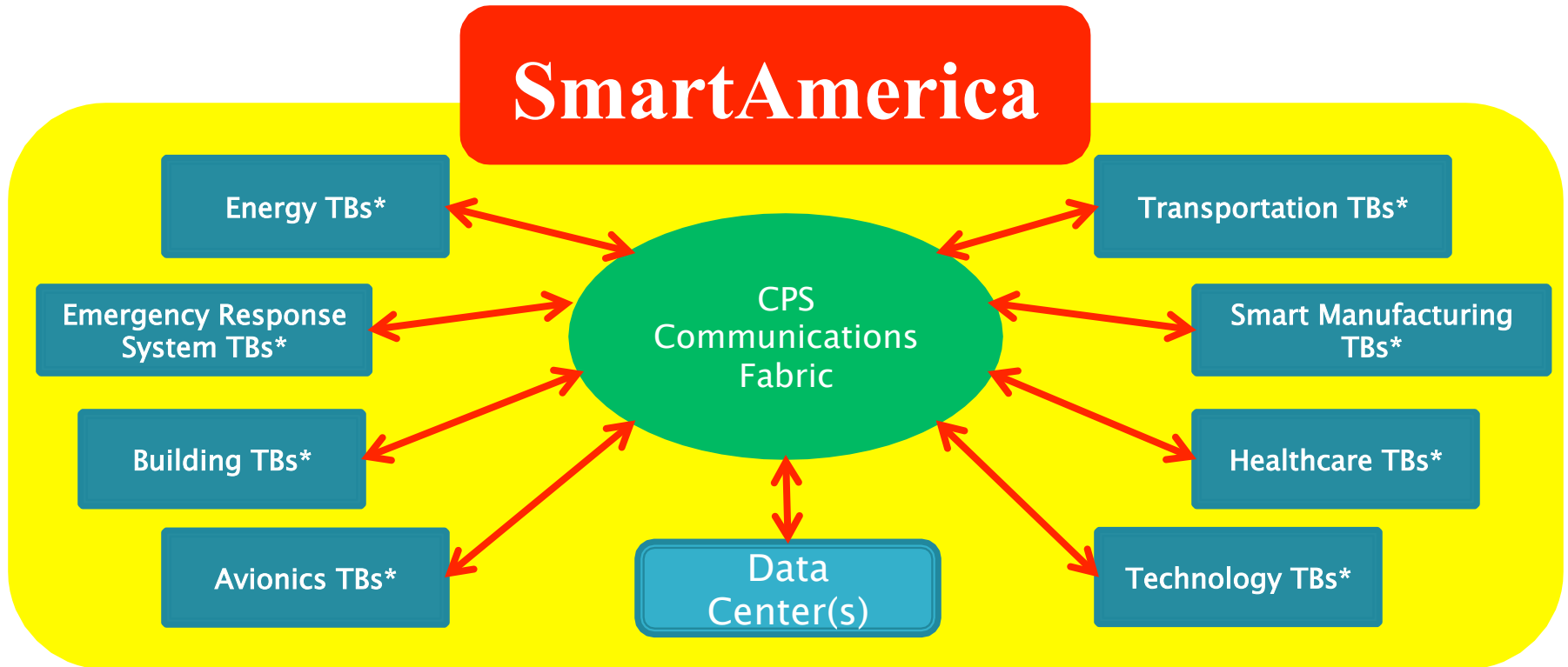
The Objective

Build an integrated Cyber-Physical Systems Framework that allows interconnection of test beds and interoperation through shared data and associated data analytics for easy integration and accelerated adoption of CPS applications.

The “Arpanet” for CPS Innovation

Smart America Overview

“Open, secure, high-confidence and collaborative CPS network “



* TBs : Testbeds can be research driven and/or commercially-driven

The “Challenge”

Given a “fabric” to interconnect CPS test beds and a set of real CPS test beds

Define a “scenario” that connects ***cross sector*** test beds

and

Build it to show the benefits of interconnected CPS.

The Virtual Cityscape

- Multi Agency
 - NIST, NSF, DoT, HHS, DHS, DoE, Ed, ...
- Multi Industry
 - Auto, Health, Energy, Buildings, ...
- Interconnect city infrastructure
- Key city functions:
 - Healthcare – e.g. Smart Hospitals
 - Transportation – e.g. V2V and V2I
 - Utilities – e.g. Smart Grid
 - First responders – e.g. Emergency Response

Crash to Care Scenario

- ▶ Disaster requiring multiple groups of Emergency Personnel
 - large number of casualties
- ▶ Need to gather EMS and other first responders
- ▶ Need to disperse EMS and injured to area medical facilities

The Framework

- High Confidence Network (“CPSnet”)
 - High speed, low latency, high determinism, resiliency
- Security
 - Private and secure communication
- Communications Stack
 - Open standard protocols (IP Suite)
- Data Architecture
 - Open, easy-to-use application protocol and semantic structure

Key Outcomes

- Demonstration of a scalable, readily-accessible, nation-wide connectivity fabric for CPS
- Development of examples of open, easily-usable CPS data exchange and security protocols
- Identification of gaps
- Presentation of model cases of the collaboration among CPS stakeholders from different sectors
- Portal listing of available open CPS testbeds (optional)

The Workshop

- December 12, 2013
- Invite participants who bring in “Lego blocks” (CPS test beds, networking technologies, data analytics, etc.)
- Present examples of framework and application scenarios
- Get participants to generate scenarios based on the available test beds.
- Determine a set of “scenarios” and team members to support development

The Challenge

- Development and Execution (Dec 2013 – Mar 2014)
 - Implement the scenario.
 - Address key technical issues across teams.
- Test, Validation and Analysis (Mar-Apr 2014)
 - Collect scenario performance data
 - The outcome of the project will be reviewed and evaluated.
 - Resolved technical issues will be analyzed and presented
 - Report identified gaps and make recommendations
- Smart America Symposium (May 2014)
 - Demonstrate the achievements and announce the results

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